

MORPHEUS LT/MRI

Anaesthesia Unit

compatible for Magnetic Resonance

code: OM3.A5s/RMN

rev. 1 : dated 10/09/2012



INTENDED USE

The MORPHEUS LT/MRI is an anaesthesia unit that can be used on adult, children and newborn patients.

The MORPHEUS LT/MRI is an anaesthesia machine compatible for Magnetic Resonance rooms from 1,5 T (15000 G) and from 3 T (30000 G) and positionable at a min. distance from the magnet corresponding to a field of 20 mT (200 G).

The MORPHEUS LT/MRI is suitable for administration of Oxygen - Air -Nitrous Oxide - Halothane - Enflurane - Isoflurane - Sevoflurane - Desflurane mixtures.

GENERAL DESCRIPTION

The MORPHEUS LT/MRI anaesthesia unit is completed with:

- mechanic gas mixing system
 - electronic lung ventilator with dual colour display
 - valves group: open, semi-closed, closed, heated, with soda lime absorber of 1 Kg. capacity
 - SIARETEX rapid connection device, Selectatec compatible for 2 vaporizers
 - gas supply group
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TECHNICAL DATA

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| Structure | Light aluminium alloy and plastic moulds (a magnetic material) |
| Wheels | Pivoting antistatic wheels, diameter 100 mm (2 with brakes) |
| Drawer | No. 3 full extension drawers |
| Cylinder support | No. 2 vertical cylinders supports, on the back side (for cylinders up to 10 litres capacity) and round rubber pads. <u>For cylinder aluminium MRI compatible only.</u> |
| Support for 2 vaporizers | On horizontal guide (SIARETEX rapid connection device, Selectatec compatible for 2 vaporizers) |
| Auxiliary power supply outlets | No. 1 schuko 220 Vac outlet (max. 6 A) |
| Work shelf lighting | 12Vdc by led |
| Dimensions | 71 x 77 x 138 (L x P x H) cm |
| Weight | 72 kg (without accessories) |
| Environmental conditions | <ul style="list-style-type: none"> • Temperature from 10 to 40°C • Relative humidity from 10 to 90% non-condensing |

GAS MIXING SYSTEM



It has the function to regulate the capacity and the concentration of gas mixture (Air, O₂, N₂O) as well as to deliver it to the anaesthetic gas vaporizer.

It allows to select the mixture to be delivered (Air - O₂, or N₂O - O₂) and the O₂ enrichment for delivered mixture in case of emergency.

The anaesthesia module includes a device which guarantees a minimum concentration of 25% oxygen in all conditions (MIX-LIFE device).

The three pressure gauges on the front panel allow the continuous control of medical gas feeding pressure coming from the gas pipelines system.

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| Oxygen rotameter | <p>Scale: 0.1 - 15 L/min.</p> <p>Resolution: 0.1 L/min up to 1 L/min and 1 L/min up to 15 L/min</p> <p>Accuracy: $\pm 10\%$ of read value or: $\pm 1\%$ of end scale whichever is the worse case.</p> |
| Nitrous oxide rotameter | <p>Scale : 0.2 - 12 L/min.</p> <p>Resolution: 0.1 L/min up to 1 L/min and 0.5 L/min up to 12 L/min</p> <p>Accuracy: $\pm 10\%$ of read value or: $\pm 1\%$ of end scale whichever is the worse case.</p> |
| Air rotameter | <p>Scale: 0.1 - 15 L/min.</p> <p>Resolution: 0.1 L/min up to 1 L/min and 1 L/min up to 15 L/min</p> <p>Accuracy: $\pm 10\%$ of read value or: $\pm 1\%$ of end scale whichever is the worse case.</p> |
| Low flows oxygen rotameter | <p>Scale 0.1 - 1 L/min.</p> <p>Resolution: 0.05 L/min</p> <p>Accuracy: $\pm 10\%$ of read value or: $\pm 1\%$ of end scale whichever is the worse case.</p> |
| Low flow nitrous oxide rotameter | <p>Scale: 0.1 - 1 L/min.</p> <p>Resolution: 0.05 L/min</p> <p>Accuracy: $\pm 10\%$ of read value or: $\pm 1\%$ of end scale whichever is the worse case.</p> |
| Medical gas supply | <p>OXYGEN</p> <ul style="list-style-type: none"> • Pressure included between 280 kPa and 600 kPa (2,8 – 6 bar) • Max. required flow 90 L/min. <hr/> <p>NITROUS OXIDE</p> <ul style="list-style-type: none"> • Pressure included between 280 kPa and 600 kPa (2,8 – 6 bar) • Max. required flow 15 L/min. <hr/> <p>MEDICAL COMPRESSED AIR</p> <ul style="list-style-type: none"> • Pressure included between 280 kPa and 600 kPa (2,8 – 6 bar) • Max. required flow 90 L/min. |
| Gauges | No. 3 on front panel (O ₂ - N ₂ O - AIR), scale 0 - 6 bar |
| Alarms | Lack or low oxygen pressure with consequent cut-off of nitrous oxide delivery |

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| Safety devices | <p>AGAINST THE ADMINISTRATION OF HYPOXIC MIXTURES MIX-LIFE: it always guarantees a minimum concentration of 25 % oxygen on mixtures which includes nitrous oxide.</p> <p>IN CASE OF LACK OR LOW OXYGEN PRESSURE CUT-OFF: audible alarm with immediate cut-off of nitrous oxide delivery.</p> <p>AGAINST OVERPRESSURE IN FLOWMETER BOX : safety valve calibrated at 0.8 bar for the protection of the glass rotameters.</p> <p>IN CASE OF LACK OR COMPRESSED AIR LOW PRESSURE : all the devices (gas feeding) supplied by compressed air are automatically supplied by oxygen.</p> <p>AGAINST THE SIMULTANEOUS DELIVERY OF AIR AND N₂O : selection by membrane key on the flowmeter front panel.</p> |
| Control for activation of exit of fresh gas for manual ventilations. | Setting of MANUAL modality on ventilator (MAN) with automatic deviation of fresh gas to the manual system of anaesthesia unit valves group, or to a TO-AND-FRO circuit with visual indicator. |
| O ₂ emergency by-pass | By apposite membrane key on the front shelf, max flow 35 L/min. |
| IN gas sockets on gas supply group | <ul style="list-style-type: none"> • No. 3 sockets for distribution system (O₂ - N₂O - AIR) • No. 2 sockets for cylinder (O₂ - N₂O) |
| OUT gas sockets on gas supply group | <ul style="list-style-type: none"> • No. 1 sockets for O₂ • No. 1 sockets O₂ - AIR for active scavenger feeding • No. 1 fresh gas connector for external use for ex. TO AND FRO (selectable by apposite membrane keyboard on the front shelf - AUX). |
| Other | <ul style="list-style-type: none"> • Socket for recycle of exhaust monitor gas • Connection for anaesthetic gas scavenging (optional device: active type, or passive type) |

BREATHING SYSTEM



Compact system with automatic connections, easy dismantable and autoclavable

It allows the ventilation in modality: real open circuit, semi-closed circuit, closed circuit at low flows.

The system also allows the spontaneous and manual ventilation in case of anaesthesia unit breakdown or machine off.

Top special CO₂ absorber canister of 1 Kg with rapid connection: this allows canister replacement also during interventions (the canister is autoclavable and reusable).

The recycling system is a selective type, hence the soda lime and fresh gas consumption are reduced to the minimum.

The heated valves group reduces the condensation and heats the fresh gas.

The transition from one ventilation modality to another is completely controlled by the ventilator without any user's action on valves group.

LUNG VENTILATOR



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| User's interface | Dual colour display 165 x 145 mm with membrane keyboard and encoder |
| Control modality | Electronic by microprocessor |
| Dead space compensation system | Automatic |
| Automatic compensation of atmospheric pressure on measured pressure | Present (max. 5000 mt) |
| Respiratory parameters default setting | Present (newborn, children, adult) |
| Flow generation | Electronic system |
| Gas feeding | Medical compressed air or Oxygen with pressure included between 280 kPa and 600 kPa (2,8 – 6 bar) |

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| Autotest | <p>Primary test: at anaesthesia unit's start-up, a control test of medical gas supply, sensors operation, back-up battery, oxygen cell, integrity of the alarm audible indicator, led on CPU board. This test takes around 15 seconds.</p> <p>Subtest: this subtest permits to verify the dead space and losses or to perform the oxygen cell calibration.</p> |
| Ventilation modalities | MANUAL, VC-VAC, PCV-APCV |
| Breathing rate | From 5 to 90 bpm (step 1 bpm) |
| I:E Ratio | 1:4 ÷ 4:1 |
| Inspiratory time | From 0.2 to 5 sec. |
| Tidal Volume | From 50 to 1500 ml |
| Minute Volume | From 1 ÷ 30 liters |
| PEEP | OFF, 3 ÷ 30 cmH ₂ O |
| Inspiratory Flow | From 1 ÷ 80 L/min. |
| Oximeter | Minimum resolution 1% / Automatic calibration procedure |
| High pressure limit | From 10 to 80 cmH ₂ O |
| Bronchomanometer | Electronic: from -10 ÷ 80 cmH ₂ O |
| Flow trigger | From OFF, 1 to 15 L/min (step 1 L/min) |
| Pressure trigger | From OFF, -1 to -9 cmH ₂ O under the PEEP level |
| Safety | Electronic and mechanical limit of airways pressure / Self-diagnosis system |
| Flow sensor | Pressure relief single patient sensor |
| Alarms | Fan Failure, Air Failure, High / Low Airways Pressure, Low O ₂ concentration, O ₂ cell into operation or not present, Apnoea, Expired Tidal Volume, Power Failure, Low Battery. |
| Measured parameters | PAW, FiO ₂ , VM, Tinsp, RATE, Vte |

ELECTRIC POWER SUPPLY

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| Electric power supply | 100 ÷ 240Vac / 45 ÷ 60Hz |
| Maximum power | 100 Watt |
| Back-up battery | 12Vdc - 3 Ah pb battery which guarantees an autonomy of around 120 minutes |
| Charging time | Around 10 hours |

CONFORMITY TO DIRECTIVES

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| Class and type according with IEC 601-1 | Class I Type B |
| Class according with 93/42/ EEC Dir.ve. | Class IIb |
| IEC 601-1, IEC 601-1-1, IEC 601-1-2, IEC 601-1-4, EN 1281-1, UNI EN 740, UNI EN ISO 9703-3, EN 4135, 93/42/ EEC Dir.ve. | |

ACCESSORIES

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| Standard accessories | <ul style="list-style-type: none"> • User's Manual • O₂ supply hose • N₂O supply hose • Air supply hose • Top Special CO₂ absorber canister of 1 kg (No. 2) • O₂ cell • Flow sensor (no. 2) • Adult silicone patient circuit • Adult Mapleson C adult patient circuit • Manual ventilation KIT • SHUKO-VDE electric power supply cable |
| Other optional accessories | See current export price list |

SIARE applies the UNI EN ISO 13485:2004 Quality System and 93/42 EEC Dir.ve.

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